

Claims

1. A method of forming a fine pattern, comprising the steps of:
forming a silicon-oxide-based film on a substrate directly or
5 by way of another layer;

forming a chemically-amplified photoresist layer on the
silicon-oxide-based film; and

transferring a mask pattern onto the chemically-amplified
photoresist layer upon exposure through a mask; wherein, in the step
10 of forming the silicon-oxide-based film, a nitrogen content of the
surface of the silicon-oxide-based film is made to assume a value of
0.1 atm.% or less.

2. The method of forming a fine pattern according to claim 1,
15 wherein the silicon-oxide-based film is deposited at a temperature of
400°C or more by means of the plasma CVD technique.

3. The method of forming a fine pattern according to claim 1,
wherein a step of exposing the surface of the silicon oxide film to
20 plasma atmosphere of O₂ or N₂O is added between the step of depositing
the silicon-oxide-based film and the step of forming the
chemically-amplified photoresist layer.

4. A semiconductor device comprising:

25 a substrate; and

a silicon-oxide-based film which is formed directly on the
substrate or on the substrate by way of another layer; in which nitrogen
content of an upper boundary area of the silicon-oxide-based film
assumes a value of 0.1 atm.% or less.

5. A method of manufacturing a semiconductor device, comprising

the steps of:

forming a silicon-oxide-based film on an underlying layer directly or by way of another intermediate layer, the surface of the silicon-oxide-based film having a nitrogen content of 0.1 atm.% or less;

5 forming a chemically-amplified photoresist layer on the silicon-oxide-based film;

transferring a mask pattern onto the chemically-amplified photoresist layer upon exposure through a mask; and

10 etching the underlying layer by way of the resist pattern, to thereby form a fine pattern in the underlying layer.

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